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SOME FISH-NOTES FROM GREAT YARMOUTH AND THE NEIGHBOURHOOD FOR 1913.

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THE past year has not been remarkable for any great Ichthyological surprises, notwithstanding the long spells of fine weather obtaining during the greater part of it, and the high temperature which the ocean maintained even until late into November, when it yet registered some half-dozen degrees above the normal condition. Owing to the latter phenomenon, and probably the long continuance of southerly winds, with strong tidal influences, the advent of the Leathery Turtle (*Dermatochelys coriacea*)—two are said to have been seen together—may almost safely be laid. Some unusually large shoals of Mackerel of a goodly size characterised the fishing during the latter part of November. Most of my summer holidays and other spare hours were spent in my new houseboat (Moorhen II.) on the Waveney, so that I did not get into touch quite so closely with local fisherfolk as in some years.

With regard to the Turtle, the first intimation I received of its appearance was on November 11th, when I saw a note in a local paper mentioning its capture in the nets of a herring-drifter, its being sold on the fish market for £3, and its reputed shipment to Hamburg. It was also stated as weighing between 3 cwt. and 4 cwt., a weight vastly increased in a succeeding "par." in the same journal on the 13th, that to me was by no means satisfactory: the weight then given was 18½ cwt. ! and

it went on to say that "it has been proved by the National (!) History Museum authorities to be an extremely rare Australian specimen . . . the strongest and heaviest ever seen in England." From a Lowestoft naturalist I afterwards ascertained that it was despatched to Messrs. Lusty, of Limehouse, importers of Turtles; and being unedible was very likely destined to be preserved. Also that the Scotch drifter that fell in with it broke its neck in hoisting it on board, although the wretched creature lived for two hours after the accident.

I wrote to the Cromwell Road Museum authorities, and received a reply from Dr. S. F. Harmer to the effect that no one at the Museum actually saw it, but the owners had telephoned some particulars. Dr. Harmer thus refers to it: "The statement that it is an Australian species is nonsense. The Leathery Turtle, though generally considered a rare animal, has a wide distribution within the tropics; and specimens are found from time to time, as stragglers, in various places." Pennant, evidently referring to this species, records two on the coast of Cornwall, taken in Mackerel nets in the early autumn of 1756, one weighing 800 lb., the other 700 lb. A third, taken about that time off Dorsetshire, equal in weight to the first-mentioned, was believed by Bell to be in the British Museum. Dr. Harmer tells me they have examples—one, for many years, from Devonshire, and another caught in Cardigan Bay in 1908, and had heard of another captured in 1909, eighty miles west of Cardiff.

Early in January I saw at a local fishmonger's a plaice of some 4 lb. weight, with the whole upper surface of a beautiful porcelain-like white, with the exception of a patch of brownish on the "face," and a narrowish dark streak near the upper pectoral fin. The fish was quite without any of the characteristic red spottings.

January 8th.—Considering the abundance of Haddock in the North Sea, in close proximity of Yarmouth, when I was a lad, its present scarcity is remarkable, if one can leave out the effects of the incessant trawling that then obtained. A 2-foot specimen was sent me from Eccles, where it had been caught on a line by a gentleman named Meale. It was a "slink," and so attenuated, either from disease, or from parasites (although only two or three *Lernæa branchialis* were taken from the gills),

that it weighed but a third of the proportionate normal weight, and looked something like a very bad imitation of an Eel. Abscesses on the gills suggested tuberculosis.

A second wretched specimen was sent me from Lowestoft by the Piermaster, on February 11th. For a length of 17 in., it only weighed 14 oz., and resembled nothing so much as a three-cornered file. The gaunt head, bare of all muscle, and merely covered by skin, looked like a skull bone, the huge eyes being unduly staring. There were a few fish-lice (*Caligus*) and a bloated *Lernæa* attached to one of the gills. There were no internal parasites, but all the organs were wasted and bloodless, and the liver was much diseased. I looked for the Hagfish, but found none. Between forty and fifty years ago, so numerous were Haddocks sometimes netted on the East Coast that, when the markets were glutted, many were taken back and thrown into the sea, in order to keep up the prices. But to-day, as a local fish merchant recently emphatically remarked, "should a Haddock show himself in East Anglian waters, he would be chased to death all over the place." One might imagine that such had been the fate of these diseased examples.

As recently as December 1st the present scarcity of Haddocks for the month was referred to in a certain journal as follows:— "The Haddock, which ten years ago was, next to the Herring, the most abundant of our food fishes, is becoming so scarce that at Aberdeen alone the shortage for the current year, up to the current week, as compared with the corresponding period of 1912, is 5200 tons." If the devil (of reckless greed) ever had a hand in anything, it was in the invention and improvident use of the trawl-net; and unless the use of this engine is forbidden on the spawning grounds of *Clupea harengus*, there will be a Herring famine in years to come.

Quantities of Sprats were being taken off the Suffolk Coast in early January. "Set" Sprats (fixed nets) and "trawled" ones are always scaleless and lustreless, and not nearly so sightly nor so edible as the "drove" Sprats—fish gilled in drift-nets.

In February a well-known angling expert in Norwich, having captured a goodly bag of Pike, offered several of them to his friends for eating, but was invariably met by the remark that they did not care for freshwater fish. This antipathy to the

freshwater species is fairly general in Norfolk, although here and there a rustic will gladly accept the biggest and slimiest Bream from an angler's catch for purposes of the table, although the usual fate of the various Roach, Rudd, and Bream is to be thrown either to the sow, or on to the refuse heap, to prove, in the latter alternative, a great nuisance. The gentleman in question, by way of experiment, had one Pike kippered and smoked, and then distributed sections of it among various persons, one of whom wrote: "I had for my breakfast a nice cut off the kippered Pike: cooked in the way usual for the dried Haddock, it was delicious, and with an entire absence of that slight muddiness of taste so often found with the Pike." The effort, however, was a failure, and these fish from the Broad's are in no better repute. It certainly is a great pity that so much good food should be wasted; only Tench being held in any esteem. I can testify to the edible qualities of a 1 lb. Bream, filleted and boiled, and served up with any suitable sauce. In my younger days it was a frequent thing for poachers to net tons of these fish and despatch them to large inland towns for the consumption of Jews. To-day they are allowed to exist only for the delectation of anglers and (as some remark unkindly) the various benefits derived from a shilling rod-tax!

March 11th.—An Eel floating and struggling at the surface of Breydon, was found by an acquaintance of mine. He had been "picking," and was returning home when he observed the unhappy fish; he struck it with his eel-pick and managed to haul it safely into the punt. He afterwards sold this fine Eel for half-a-crown. Noting that its throat was unduly distended, he had the curiosity to force open the jaws, when he observed the tail of another fish: on extricating it, a task of some difficulty, he found it to be a Sea-Bullhead (*Cottus scorpius*), whose extended gill-spines had made its removal, either way, impossible for the Eel, which would certainly have perished by choking, had this man not chanced to fall in with the "unequally-yoked" and unhappy pair.

An almost similar fate attended another large Eel, in the following August, near Kendal Dyke, in the Thurne river, when a want of the sense of proportion led this fish to attempt a feat of swallowing that it was quite incapable of performing. Mr. Collinson, the water bailiff, was rowing towards Martham when

he noticed a very large fish, which proved to be a 7½ lb. Eel, floating on the surface: on picking it up he was astonished to see the head and some three or four inches of another Eel, of some considerable size, protruding. Both had fallen victims to the voracity of the larger one.

Whether fishes are blessed with anything like a memory, or whether they are less susceptible to pain than most other creatures, has not yet been satisfactorily determined: evidence is conflicting. When trolling with a noted angler on one of the Broads, related an old sportsman to me, a large Perch was hooked, which broke away, tearing the membrane of its mouth. It was struck a second time, and again broke away, but a third hooking proved fatal. When the fish was landed three rents in the cartilage of its mouth were discovered. Yet strangely, some time since, when I was chatting with Miss E. L. Turner on Hickling Broad, she pointed out certain fishes that had come constantly to her houseboat to be fed; one of them, a war-scarred old fellow (a Rudd, I believe it was), she assured me had come to her vicinity two or three years running. The fish were curiously tame, and rushed at crumbs dropped quite close to my fingers. In 1913, Miss Turner told me that some Eels had become so tame and confident as to take crumbs from between her fingers. One day they were missing; probably they had taken some angler's hook, or had perished in some other way.

On March 18th an 11 in. female Gurnard (*Trigla gurnardus*) was sent to me by a fish hawker: its head was stunted, the upper lip overlapping the under one, on either side, the lower jaw protruding considerably beyond the obtuse little snout.

April.—A small Plaice, about 6 in. in length, measured 4½ in. across the back when the fins were distended. Placing the point of a pair of compasses in the centre of the fish (making allowance for a half-inch of "nose" and the caudal fin's measurement of 1 in.), the other leg of the compass made a complete circle of the fish; indeed, in sketching it, I first made a circle, and then easily "filled in" the whole.

The advent of an exceedingly fine Sturgeon in the little river Delph, near Welney, on June 16th, made quite a stir in that corner of Norfolk. Its weight was 31 st. 5 lb., and it measured 9 ft. 9 in. in length. The monster was despatched to Spitalfields,

where it was sold for £6: the fish auctioneer telling a newspaper representative that "it took six porters to bring it from Liverpool Street Station to my shop. It was wrapped in sacks and tied up with thick cords. I have never seen a fish so large, and I thought at first a small whale had been sent to me."

The fish had been first observed on the Sunday, and attempts were made to shoot it, but the cartridges were loaded with too small shot to make any impression on its scaly cuirass: even shot the size of peas, fired as they were through the water, had no effect. A net was drawn across the water to prevent the fish's escape: a boat was launched, and the owner of the shooting rights, a Mr. Smart, went in her armed with a weapon very like a strong boathook. This was thrust into the mouth and the head raised by means of it, then another man who was carrying the gun discharged it into a more vulnerable and vital quarter. Five men were required to land it.

On June 3rd, Mr. G. C. Gearing, fishmonger, of Lowestoft, very kindly sent me an example of the Boar Fish (*Capros aper*), the first he had seen during the thirty-five years of his business. It had been netted on Corton patch, about half a mile from Corton Lightship, in a shrimp-net. It was hardly so large as my hand, and is only the third I have examined since my first discovery of the species, locally, on July 9th, 1881. A second example, which I did not see, was netted off Yarmouth on the same date as Mr. Gearing's.

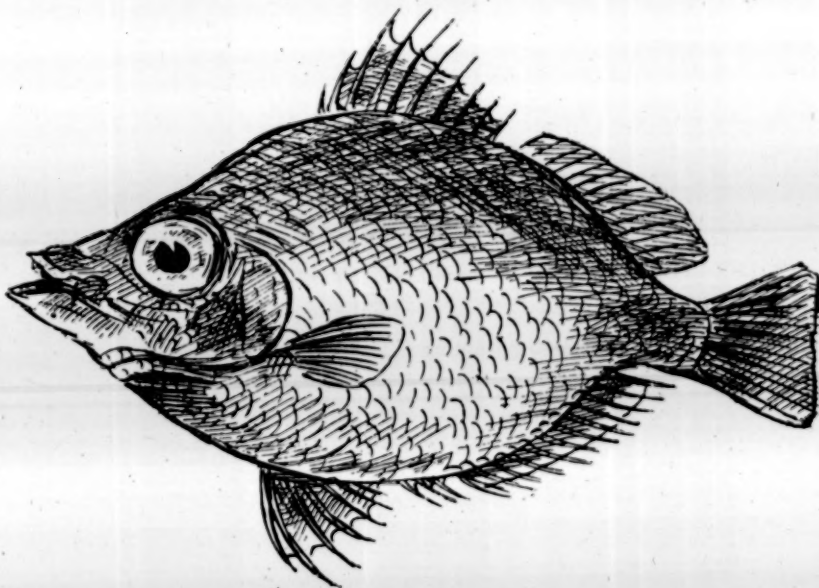
Whether there be anything in the belief among certain fisherfolk with regard to so-called "blind" Mackerel, I am not prepared to say. The belief is pretty general, and there is a Scarborough tradition to the effect that "it is no use fishing for Mackerel with a line before Seamer Fair [*i. e.* July 15th], for before that time they are unable to see." Ignorant fishermen may be certainly excused, when Pennant, probably on the strength of Lacapède's statement, who himself had been told it by a certain French Admiral, wrote as follows:—"In the spring the eyes of the Mackerel are almost covered with a white film, during which period they are half blind. This film grows in winter, and is cast off in the beginning of summer."

Dr. Day, ignoring his predecessors, in describing the diseases of *Scomber*, practically pooh-poohs the idea. I mention this

matter because two or three intelligent fishermen have recently spoken to me most emphatically in favour of such a condition being frequent.

The stomachs of some Eels taken in marsh ditches by means of a net, in August, I found to contain only a quantity of *Gammaridæ*.

Occasionally the smaller Pike will condescend to patronize an angler's worm. A gentleman fishing in the Bure at Acle, one



BOAR FISH (*Capros aper*).

day in September, hooked and landed on a small worm a "jack" of 4 lb. weight; and within half an hour another angler, fishing with a worm, landed a 2-pounder.

The bottom of the cutting (leading into the Waveney) wherein my houseboat lies moored is, in summer, covered with a bright green, luxuriantly-growing coat of "silk weed." Some Swans came daily in August and early in September to feast on it; and several Roach which I dissected had their stomachs packed with it.*

The hordes of Herrings crowding each autumn into local waters would seem to be as numerous as ever, if a greater catching power and a record harvest are any criterion. The

* This weed is occasionally used as a successful Roach bait by London anglers.—(Ed.)

hugeness of the catch of 1913 has been almost phenomenal. It goes without saying that some vagaries of distribution would naturally follow such invasions; and, on October 29th, whilst some Aldeburgh fishermen were busy with rod and line among the Whitings—also uncommonly numerous on the Alde, twelve miles from the sea—Herrings were attracted to their lugworms which they were using as bait; at these they bit very much after the manner of Roach, and gave some lively play, a dozen in all being hooked. This distance from the sea had been eclipsed by a stray Herring that had wandered as far as Geldeston locks, on the Waveney, and was taken in a net with Smelts, some years since, a journey of quite eighteen miles from Lowestoft Harbour. This individual, had it entered Oulton Broad through the lock, or had it passed through Breydon, and so up the Suffolk river, must in any case have gone some miles in quite fresh waters.

The capture of individual adult Herrings by rod and line, above referred to, was not a solitary instance, although in this neighbourhood rather unusual. Day ('British Fishes') mentions their capture in Scottish lochs as a common circumstance, bare white hooks being drawn through the water at which they freely snatch. A writer in the 'Angler's News,' dealing with the subject, stated that at Calais Docks, from January to March, "spent" or spawned Herrings are to be seen in numbers preying on young Elvers. Anglers took advantage of their voracity, and captured numbers by impaling a small worm loosely on hooks that they drew quickly through the water. Juvenile Herrings, not longer than one's finger, are very freely taken every summer in the Lowestoft Basins, the anglers, of all classes and ages, using a tiny quill float and a single hook baited with a piece of Shrimp the size of a B.B. shot.

The strangest Herring story of the year was published in a local paper on November 25th, relating to a "bloat" that was being prepared for breakfast by a lady in Norwich. "She noticed something glittering, and her curiosity being aroused, she made the surprising discovery that a gem of some description was nestling among the offal. On washing the stone it was found to be a diamond of some worth, being highly transparent and colourless." The stone is stated as being the size of a marrow-fat pea, and had, it was thought, once been set in

a ring. If such were the case, the strange circumstance leads one's mind to queer speculation.

The Scad, or Horse Mackerel, has been exceedingly numerous this fishing, and running to a largish size. On one or two occasions the tide-mark, thick with dead Herrings and Mackerel *débris*, from the nets drawn in by certain tides, was well sprinkled with fish of this species. I cannot understand why this fish is so despised locally as food, even by the very poorest.

The finding of an anchovy in a "swill" of Herrings was reported to me in the middle of October. This fish is of rare occurrence here, for the advent of such a remarkable species would speedily lead to its recognition. If Couch's remarks ('Cornish Fauna') still hold good, that "this fish abounds towards the end of summer; and if attention were paid to the fishery, enough might be caught to supply the consumption of the British Islands," it is surprising that individuals should not more often straggle round into the North Sea. The meshes of the nets are so much smaller to-day that few fishes, smaller than Herrings, striking them escape.

There was a remarkable inshoring of Whittings in September, the numbers keeping up without any seeming diminution well through November: it seemed to me curious that so comparatively few should be taken in the Herring nets considering the—I think I may say—myriads that came within the three mile limit. Every boy armed with a piece of knotted string and a couple of hooks, with almost anything for bait, seemed to be almost as successful in capturing them as those who had provided themselves with superior tackle and knowledge. The jetty was so crowded that folks fished, as it were, over each other, and the piers and beach were lined with sea-anglers. Some of the figures published of catches taken from the Britannia Pier are given as follow:—

Nov. 5th	...	978	Whittings	...	10	Dabs	...	4	Cods.
„ 6th	...	1859	„	...	13	„	...	5	„
„ 7th	...	1202	„	...	14	„	...	4	„
„ 8th	...	1263	„	...	12	„	...	5	„
„ 9th	...	1614	„	...	4	„	...	2	„
„ 10th	...	1311	„	...	13	„	...	3	„

At the harbour's mouth, on the Yarmouth side, there runs a

sort of concrete and timbered breakwater which is accessible from a staging by means of iron rings let into the buttresses supporting the staging. At high water, and for some time before and after, the water covers this low breakwater, and if it be rough waves break over it. Behind this is a kind of hollow, quite 6 ft. in depth, that is always full. Curiously enough Whitings frequently crowd into this pit, and some venturesome lad a year or so ago found, on dropping his line into it, that it was quite a fertile fishing ground: so at the fall of the tide it is a frequent resort of lads who occasionally capture a number of smallish sized fish. On October 29th I happened to look over the wooden pier into this hollow, and saw three or four lads fishing with improvised tackle—a long crooked osier, and, in one instance, a badly straitened hoop, with the sorriest of lines upon them. They were pulling out foot-length examples almost as quickly as they dropped in their hooks, using for bait small strips of very stale Mackerel, picked up on the tide-mark a short stone's-throw from the pit. A butcher lad, who had delivered his beef to some fishing drifter in the harbour, had encroached upon his master's time, but evidently was prepared to make excuse, if not atonement, with the silvery Whitings that nearly filled his basket.

Mr. F. T. Lenton, Master of Claremont Pier, Lowestoft, wrote me on December 1st that there had been exceptional takes of fine Whitings, one sea angler about a week before, having had a bag of twenty-two fish weighing 18 lb.

Mr. H. Tunbridge, the Manager of the Britannia Pier, Yarmouth, on December 6th wrote to the effect that "this season has been a record one for Whitings." From October 16th to December 5th a total of 57,326 had been landed thereon; also 351 Dabs, 396 Codlings, 5 Cods, and 4 Congers. Several Soles were caught in August and September.

I am obliged to Mr. Ernest B. Cooper, of Southwold, for a few notes on the Sprat fishing, &c. He writes as follows: "Sprat fishing has been very dull until this week: no Sprats were caught until the second week in November, and during that month the quantities landed at the Harbour were:—

Week ending Nov. 15th	...	...	233 bushels.
" " " 22nd	....	...	140 "
" " " 29th	....	...	150 "

About double the quantity is landed on the Beach, but no figures are available. A Bass about 12 lb. in weight was caught off the Pier in November."

I observed in the 'Daily Press' of December 10th that the Sprats "set in" abundantly, heavy catches being taken into Lowestoft by the Lowestoft, Kessingland, and Pakefield boats, ranging up to some eighty "maunds" (local *baskets*): these realized from 3s. to 3s. 6d. the maund.

My old friend Mr. Robert Beazor, fish merchant, writing me on December 9th, states that "the Smelt season was very poor, and to the workers not very remunerative: the fish were small. I take it that they do not like the polluted state of the water through which they have to pass to their spawning haunts: and I think that year by year their numbers are less. I found Salmon-Trout conspicuously absent, and those taken were small. The best take of the season came from Winterton. Our own local fisherfolk seem to have quite gone out of this branch of fishing [at one time our beach men made quite a feature of the autumn draw-netting for the 'trout']. The Mackerel season (May and June) was a fair one, and I saw only a few Scribbled Mackerel (*Scomber* var. *scriptus*), and one black one (*S.* var. *concolor*). I had during the year four Anchovies brought me for identification—Red Mullet a few. Large Mackerel came late in the Herring fishery. I weighed several; the largest was 2½ lb., and many exceeded 2 lb."

The voracity and want of discrimination in the Pike is well-known; and the bold fellow occasionally attacks more than he can possibly hope to devour. In September a lady, bathing in certain baths at Norwich, was bitten severely in the ankle by a Pike of some 6 lb. or 7 lb. weight. The bite of a "jack" is by no means a pleasant experience, as I can remember to my own cost, when a 5-pounder seized my finger, closing its jaws with a vicious snap, puncturing holes that were slow to heal and extremely painful. I had to lever the brute's jaws open with a piece of wood before I could free my finger.

I have a note dated June 22nd recording the capture of six Salmon-Trout at Oulton Broad, near the lock, by one fisherman on that date, fishing with live Shrimps. On October 29th following Mr. J. T. Hotblack, of Norwich, in a letter to the

'Eastern Daily Press,' referred to reports reaching him from time to time of Salmon or Salmon-Trout being caught in the river (Yare)—July, August, and September (1913). Hewett, the Preservation Society's watchman (he stated), had found no fewer than seven dead and decomposing fish at various times floating in the river between Surlingham and Cantley. They were described as fish weighing between 12 lb. and 20 lb., suggesting they must be Salmon. Mr. Hotblack wrote me for particulars of three Salmon-Trout captured at Oulton, and agreed with me that such Trout as I had observed "jumping" may have done so through irritation by the dirty (sewage-tainted) water. His contention was that the Trout caught so commonly along shore, all down the Norfolk Coast, were "trying to find a freshwater stream to run up, and that they constantly enter our rivers trying to find a spawning-ground, which, as they are unable to get past the mills, they cannot do." I did not come to the same conclusion, seeing that they would have to travel a great many miles up any of the Norfolk rivers before finding a bottom and other conditions suitable for their purpose. Undoubtedly such Salmon and Salmon-Trout as have been met with well up the Yare and Waveney travelled up from Yarmouth and through Breydon, and not through Oulton Lock from Lowestoft Harbour. It is strange that the Salmon referred to above had not been observed *before they were found putrefying*. Had they really come upstream, or had they been cast overboard by a fishmonger?

Some very heavy catches of Mackerel were made by local drifters fishing with Mackerel-nets in November. On Sunday afternoon, November 23rd, a boat ran in with fish packed and piled in every possible locker and corner; the decks were thick with them, and the nets lay heaped—fish enveloped in the folds in hundreds—on decks and hatchways. They were still busy well into the night "scudding" (shaking out) the nets and pulling the larger fishes from the meshes, and piling them on the wharf in a huge heap 2 ft. deep, in an area surrounded by a flanking of "swills" (fish-baskets). Nearly seven lasts (70,000) of exceedingly fine Mackerel, many of them measuring 17 in. in length, were the result of the "strike"; but so many had "struck" that the nets "grounded" with the weight—i.e. sank

straight down—and quite fifty nets were lost with the fishes they contained. A boat's "fleet" of nets consists of one hundred and twenty sections, and reaches out, like a long-meshed wall, to something like one and a half miles, and is about eight to nine yards deep.

On the 26th the same boat returned again with a catch of 30,000 Mackerel that realized £120. Clearing the nets of Mackerel is a trying occupation for the fingers, almost every fish having to be individually pulled out of the meshes. A few days later another boat came in with eight lasts.

Late in November a sea-angler, fishing from the beach, hooked and landed a Mackerel, a by no means usual capture so near the shore, and a rare enough circumstance from any of the piers.

Years ago, when a number of old brigs and kindred "sea-waggons" served as colliers between Newcastle and Yarmouth, it was a common practice to trail a line astern for the capture of a few Mackerel. The hooks were encased in a small piece of lead-paper, the silvery bait evidently deceiving the rash, eager-biting Scombers. One ancient skipper, finding himself without lead-paper, managed to push the barb of a hook through a hole in a fourpenny-piece, and during the trip succeeded in bribing a baker's dozen—thirteen—of Mackerel to their own destruction.

Reverting to nets "grounding," a veteran Mackerel-catcher assures me that often meshed Herrings are more likely to swim up with the net and "frap about at the surface," but Mackerel "crook (die) at once, and their combined weight carries the net downwards, providing they strike heavily."

It would be out of place here to enlarge upon the purely economic aspects of the great East Coast Herring Fishery; the following statistics, however, may be worthy of mention. Briefly, about 800,000 crans of Herrings (800 million fishes!) had come in by the end of November, 40,000 crans having been delivered in one day alone (October 18th). Lowestoft had in the same period added a catch about two-thirds as heavy as that arriving in Yarmouth—1,300,000 crans for the two ports, a prodigious congregation of 1,300,000,000 fish! The weight of the Yarmouth catch may be set down at 155,000 tons, and for the two ports at 260,000 tons. Placing these catches upon the rail would have

required a thousand trains of twenty-six ten-ton trucks each! Up to the time of writing these figures (November-end) 457,212 barrels and 137,138 half-barrels of pickled (salted) Herrings have been dispatched in steamers to Russia, Germany, and other ports; one large steamer, the 'Indutiomare,' had gone to the Black Sea with a freight of 18,175 barrels, worth £20,000.

Thus it will be seen that with 999 drifters (Scotch and English) fishing out of the port, the thousands of men manning the boats, the thousands more working as coopers, carters, curers, and others; not mentioning the many incidental buyers, traders, and mechanics attached to the building, fitting, outfitting and feeding necessities connected with this great industry; and the thousands of Scotch lasses engaged in gutting, pickling, and other work, and the hundreds who lodge the girls and the men, the turnover in solid gold must be immense. Had Bertram lived to see Yarmouth the greatest Herring mart in the world and to revise his entertaining 'Harvest of the Sea,' he would have had to add matter to the book that his wildest dreams and speculations could never have depicted. If the streets of London are paved with gold, Yarmouth's roads and pathways are often ankle-deep in the greasy, oleaginous mire and mud, permeated with Herring oil and drip from the carts and baskets and barrels. The hooting of outgoing and incoming boats, often in continuous panoramic succession, with the rattle of wheels on the quays, is like Bedlam gone riotous; and the southern half of the town reeks of smoke and effluvia of "an ancient and fish-like smell."

Up to December 6th over 808,000 crans had been landed here, an increase over last year of more than 127,000 crans. On this date Herrings were getting fewer; but the record price of 91s. per cran—for a catch of six crans—was realized! Whether the hosts of the Herring are greater than in days of yore, I am not competent to suggest; that there must be far fewer devoured by Whales would seem to be an undisputed fact, when it is stated that "so enormous have been the catches of Whales [Rorquals, Humpbacks, &c.] made in the Norwegian whaling industry since the invention of the explosive harpoon in 1868, the figures of 1911 being 13,800 Whales, that it is feared that the animals are in danger of extinction." Such a slaughter

of these huge Herring-eaters, and the much fewer numbers of other predaceous Cetaceans, Cods, and other large fishes to be found to-day in this part of the North Sea, must make for at least a possible increase in this great East Coast harvest of the sea.

The Messrs. Paget writing in 1834 ('Sketch of the Natural History of Great Yarmouth') with regard to the then more frequent appearances of Cetaceans, remark: "*Balæna physalis* (Fin-backed Whale) has several times been seen and taken in the herring-nets"; and, again, "*Delphinus bidens* (Bottlenose Whale), a large one caught in a Herring-net, November, 1816; a smaller specimen about twenty years before." The first-named would belong to the Rorquals.

Only in the opening days of the great Herring Fishery did a few small carcasses of Piked Dogs wash ashore: as the fever and hurry of the fishing intensified, everything was subordinated to the capture and to the inbringing of the Herring. Men worked night and day, often getting less than four hours' sleep in three days (a condition of labour with which trade unions *might* safely interfere), so that everything foreign to the desired catch was pitched overboard as soon as possible; not a solitary Shark, Dolphin, or Porpoise, to my knowledge, was brought into port; the only one of the first-named referred to in the county papers was an average-sized Porbeagle, taken near Sheringham; this a fisherman or two carted about in a barrow as a *rara pisces* for the sake of what few coppers the curious might bestow upon them.

Among the few Crustaceans worthy of remark, I have already recorded the capture of a large Edible Crab (*Cancer pagurus*) off the coast of Portugal (cf. 'The Zoologist,' Feb. 1913, p. 77), the large pincer claws of which I had seen mounted on a shield like a Fallow Deer's. The size of this giant may be imagined when I measured a free chela (or movable claw) at 6 in., working in a "hand" 9 in. in girth!

A male Velvet Crab (*Portunus puber*) was brought to me by a shrimper on April 28th; and on May 20th a medium-sized Crab came to hand with an extra leg growing on the left side, from an extra socket working on the "swivel" of the third leg from the tail.

On June 8th a very curious example was obtained, with the free chelæ adorned, or inconvenienced, by an extra point that turned off at a right angle and curved slightly under the fixed chelæ, so that very little movement could be made by the nipper; roughly speaking, it was as "lockjawed" as a rodent would be whose abnormal incisor tooth might have grown round and closed its point in the outside of the other jaw. On the 23rd a "big



Edible Crab (with abnormal pincer claw).

claw" was given to me to which was attached a smaller perfect claw with fixed and free chelæ quite in working order.

For the benefit of those who might like to see or study such crustaceous variations, I may add that these have been sent to Kelvingrove Museum, Glasgow, where many other similar finds have preceded them.

One other curious Crab that has been preserved for Yarmouth Tolhouse Museum came to hand on September 6th. The right pincer claw (looking down on it from above) is normal, but the left, of equal size to it, is turned quite in an opposite direction

(see illustration). The photograph unfortunately does not show the defaulting leg in its proper proportions. What use the Crab made of its freakish member could only have been known to its possessor, and the secret has been lost in the boiling.

In September somewhat unusual numbers of the Common Prawn (*Palæmon serratus*), many of goodly size, were taken by the shrimpers and met with a ready sale. One shrimper assured me he had taken as many as thirty on a tide.

Mr. F. C. Cook, of Lowestoft, sent for my inspection late in December (1912) an example of *Dromia vulgaris* taken off the 'Galloper' light-vessel (vide 'The Zoologist,' 1913, p. 38). I have never met with it at Yarmouth. Mr. Cook also kindly sent me a few notes referring to a trip made by him in a Lowestoft smack to the Smith's Knowl (about twenty-five miles out from the north-east corner of Norfolk) in the second week in September. The first two or three days were more or less blanks, as far as his experiences went! "Scarcely a haul was made but what two or three examples of the Angler-fish (*Lophius piscatorius*) were met with; those examined contained *great quantities of sand*. A large Cod was taken on the 11th, the eyes of which were sunken and colourless; and it was in a very emaciated condition. A malformed Cod was caught on the 12th, and also a bull-head variety of the Whiting; a second malformed Whiting being met with the day after. While trawling on the rough or 'Ross-bottomed' ground (where *Sabellæ* and shells, &c., abounded) in the vicinity of the Smith's Knowl Light, a great variety of Crabs was taken, among the more interesting of them were the Ross Crab (*Zantho rivulosa*), Porcelain Crab (*Porcellana longicornis*), Marbled Swimming Crab (*Portunus marmoreus*), and several Velvet Swimming Crabs (*P. puber*). The latter were very ferocious and menacing, and caused fun by the way they elevated and opened their pincer claws and ran at the skipper's dog, who, knowing from experience the penalty he had beforetime paid by playing with Swimming Crabs, wisely kept at a safe distance.

"A fine Sturgeon, weighing 20 stone and realizing £11 10s., was landed on Lowestoft fish-market on October 30th."

Some interesting notes and statistics were given in the 'Eastern Daily Press' of Dec. 6th, 1913, dealing with the little-known industries off the North Norfolk coast, which include those

of whelking, crabbing, cockling, and such like. For 1912, of a total weight for England and Wales of 55,103 cwt., 15,897 cwt. were landed at Wells, and 10,216 cwt. at Sheringham. One hundred boats are engaged in crabbing, and accounted during the past season for nearly a million Edible Crabs (*Cancer pagurus*). The gathering of Cockles by men and women is a hard but interesting calling. Mussel culture is a thriving industry, and is well looked after by Inspector Donnison. The capture of Herrings, Mackerel, Soles, Plaice, Brill, and Salmon-Trout is in a smaller way pursued; whilst the quaint occupation of "worming" is made remunerative. The Lugworm (*Arenicola marina*) is pursued by "worm-diggers," who, armed with fork and basket, go to the wet sands at low water and search for their casts and deftly grub them out, a quick hand looking to bag a thousand under normal circumstances. These worms are great favourites with sea-anglers all over the eastern seaboard, and find a ready sale. There can be no doubt that Cods and other fishes prefer them to any other bait.

Norfolk Seals.—I have to thank that capable and enthusiastic officer Captain Donnison, the Eastern Sea Fisheries Inspector, for his September Report, which equals in biological and statistical interest any of its predecessors. But that part of particular interest to myself deals with the Common Seal (*Phoca vitulina*), that seems to have firmly established itself upon the maze of sandbanks in the Wash.

One would greatly wish to know *when* the Seal became what might be described as a settler in this country. Sir Thomas Browne (1605–1682) refers to it as "the Vitulus marinus sea-calf or seale wch is often taken sleeping on the shoare"; and again as "no raritie upon the coast of Norfolk at lowe water. I have knowne them taken asleep vnder the cliffes. diuers have been brought vnto mee. our seale is different from the Mediterannean Seale." Lubbock ('Fauna of Norfolk,' 1848) adds nothing to Browne's short notes; nor does Mr. T. Southwell in his second edition of 'The Fauna' (1879). In his 'Seals and Whales of the British Seas,' Mr. Southwell adds but little, dismissing with the merest paragraph its status on this coast as follows:—"In the great estuary between the Norfolk and Lincolnshire coasts, called the 'Wash,' this species frequents the

sandbanks left dry at low water, and, doubtless, many young ones are produced there annually."

According to Mr. Donnison's calculations, the Seal practically doubles its numbers in two or three years; to quote from the 1912 (September) Report:—"It was estimated that over 2000 Seals were in the estuary. . . . It was estimated that there would be 100 young Seals in this [Knock Sand] group of about 300."

In 1911 the numbers were put down at 1000, so that 3000 were expected "to rank" in 1913; of these, he tells us, £45 has been paid for "noses," at the rate of ten shillings each. Ninety Seals would seem a goodly number recovered; but when it is known how difficult wounded Seals are to bag, and that a dead Seal almost invariably sinks if slain in the water, the death-rate must have been considerably higher.

The Report is this year the more interesting, if disappointing, when "opinions" as to their predilections for certain fish, and the destruction they are capable of performing, are given by various fishermen, *not one of whom had by dissection examined the contents of their stomachs*. Like a perverted Mark Tapley, the average fisherman is only happy when he has something to grumble at; a number of them condemned the Seal as keenest upon prime marketable fish, Soles in particular. My own experience with several Seals I have kept in confinement was that Flounders (local "Butts") are their favourite prey; probably they are easiest to capture; and when Eels were to be had these were as eagerly devoured, bent double, rounded part foremost.

Mr. Donnison is rightly making an earnest endeavour to come to a just conclusion upon the Seal's reputed destructiveness and injury to the fisheries of the Wash, so that we may have further information on the subject. It would be a great pity if this interesting colony should eventually be extirpated; and a certain amount of cruelty which must follow on the methods used to accomplish at least a reduction in numbers is unpleasant to contemplate. The Eastern Fisheries Committee, I sincerely hope, will not "condemn unheard," but do the right thing between fisherman and beast. A vice-president of the Selborne Society writes me that the matter may be taken into consideration by the Society; he says:—"I am told that many

of the fishermen say they have no grievance against the Seals . . . the effect of offering such a large reward will simply be that every 'Tom, Dick, and Harry' with a gun will go out shooting Seals. . . . A large proportion of the heads produced are probably females and newly born young, which seems a great shame. These no doubt represent but a small proportion of those wounded."

With all my heart I hope the energetic Inspector will see the right thing done, and if it be possible that the evidence forthcoming should be in favour of these innocent animals, they will not be unduly harassed; and if it be proved necessary that a reduction in number be imperative, that vigilance will be exercised in doing the butchering "on the most approved modern methods" possible.

There is a significant remark made in the Inspector's March Report respecting a nose sent in; the particulars coming in with it were as follow: "The Seal I caught was a white, long-haired one; female." And the Inspector himself remarks:—"On January 17th, on passing Freeman's Channel, I observed a score of Seals on the Roger Sand, three or four of which appeared quite white alongside the others. When on the sands on March 14th . . . I then noticed that three or four of the Seals had long, rough hair, in colour a dirty white. They were slower than the others in reaching the water."

Now, as it is well known that the young of the Grey Seal (*Halichærus gryphus*) are born white, and my somewhat limited experience of this species has led me to believe it less nimble out of the water than the commoner animal, one might suspect that the Grey Seal does more than occasionally occur in company with *Phoca*. A young female was killed on Breydon, November 28th, 1882; and in the 'Field,' 1904, some notes on this species by Mr. T. Southwell appeared. Herein he remarked that even young had been born, but that the conditions did not appear suitable to their long survival. He says:—"Although these sandbanks may form admirable nurseries for the numerous herds of *P. vitulina* which frequent them, no young Grey Seals deposited where the banks are covered by every tide can possibly survive, and they must . . . perish by drowning" (*vide* 'Nature in Eastern Norfolk,' pp. 319-320).

ON SOME GULLS OBSERVED IN IRELAND.

BY ROBERT WARREN.

ICELAND GULLS (*Larus leucopterus*) IN CORK HARBOUR.

FOR a long period of years I have had frequent opportunities of observing and capturing specimens of the Iceland Gull, and as I was particular in noting the dates and localities of the various occurrences, a copy of my notes may interest those readers of 'The Zoologist' who may not be personally conversant with the appearance and habits of this Arctic visitor, one of the most beautiful of the large Gulls, and certainly the most elegant and graceful in form and flight. When seen on the wing it is easily distinguished from its larger neighbour, the Glaucous, by its gracefully buoyant and gliding mode of flight, so different from the slower, heavier flight of that bird, similar to that of the Great Black-backed Gull. In its habits, so far as my experience goes, it is not a carrion-feeder like the Glaucous—I have never seen it feeding on carrion of any kind. I have often seen the Iceland Gull resting in pasture fields in company with the smaller Gulls, a habit I have never seen adopted by the Glaucous, which keeps nearly altogether to the shores and sands. The Iceland Gull I have often seen with the smaller Gulls in the fields following the ploughman, feeding on the worms and grubs turned up by the plough.

On one occasion an immature bird haunted one of my ploughed fields for over a month, day after day, only going to the estuary to drink and wash. From its great tameness I did not wish to shoot it, but tried to take it alive on a baited hook; this was easily managed, but unfortunately the poor bird was so hungry that in swallowing the bait the hook became firmly fixed in the gullet, and being unable to extricate it safely, I was obliged to put the bird out of pain, and sent the specimen to the Dublin Natural History Society, thus disappointing me in the wish to send a live specimen to the Dublin Zoological Gardens.

I first became acquainted with the Iceland Gull in Cork Harbour, a "flight" having visited it, in the winter of 1848-1849,

and individuals were observed in different parts of the harbour from time to time.

1849, January 25th.—The first I met was when returning from shooting on Seamount Marsh, and while walking along the embankment, a lovely bird flew close past; its buoyant gliding flight and white primaries at once identified its species.

On January 29th, when returning from Queenstown in my boat to Ringaskiddy, and just above Haulbowline Island, a fine bird passed our boat out of range, but returning as if to observe us more closely, and coming within easy distance, it was brought down by my brother by a shot from his light gun. This was only the fourth specimen known to have been obtained in Ireland. I presented the bird to my old and valued friend Dr. Harvey for his fine collection of native birds, and it is now, with the rest of his collection, in the Museum of the Cork University College.

On February 2nd, when returning with my brother from shooting on Seamount Marsh a fine specimen flew close past us, but as both our guns were unloaded after we had stopped shooting, this lovely bird, to our great disappointment, escaped us.

On February 8th, when returning from Queenstown in my boat, a fine creamy-coloured bird flew past our boat, but out of shot. This was the last specimen I observed in Cork Harbour. Having some time after left the district to reside at Moy View, Co. Sligo, my future observations of Wild Fowl and Sea Birds were confined to Killala Bay and the Moy Estuary, in the counties of Mayo and Sligo; these observations were made during the years 1851 and 1909.

1851.—On December 4th, when walking on the sands along the Moyne Channel in Moy Estuary, I shot an immature specimen as it flew past me. This bird I sent to my old and valued friend, the late William Thompson, of Belfast, who presented the specimen to the Belfast Museum. The day has been well impressed on my memory, owing to my shooting a grand specimen of the White-tailed Eagle on the sandhills. A pair of these fine birds had been, from October, haunting the sandhills of Bartragh, feeding on the rabbits and any dead fish thrown up on the shore. When returning, after shooting the Gull, I perceived an Eagle flying slowly over the sandhills, alighting on a little hummock. I remarked to my brother (who

was with me) that it was a good chance to try and stalk the bird from behind another little sandhill, and asked him to try it, but he only laughed at the idea of shooting such a wary bird. So, giving him the Gull to carry to the house, I made my way to the sandhills, and quietly crept up behind the sheltering hummock to within about ten yards of the one the Eagle was standing on. I put my gun to my shoulder as I raised my head over the sheltering hummock and, on the instant, the bird spread his wings to go, but too late, for I fired and knocked him dead with a charge of No. 5 shot. He was a very large bird, in the second year's plumage. Had he not been gorged with a heavy feed of Rabbits and Hake (over six pounds weight), I don't think I should have succeeded, the heavy feed causing him to be careless and not so watchful as usual.

On December 9th, when walking on the Enniscrone Sands by the river, I saw a very dark specimen, evidently in its first year's plumage, in the company of some Herring and Common Gulls; it was remarkably tame and unsuspicious, allowing me to approach within eight or ten yards.

1855.—On December 9th a bird, evidently an adult from its pure white plumage, flew close over Moy View Cottage towards the estuary sands.

1862.—On January 26th I caught, on a baited hook, the young bird (*ante*) that had been haunting the ploughed fields for over a month.

On January 27th, when riding along the Enniscrone Sands, among a number of small Gulls I observed a very dark-coloured bird that must have been in its first season's plumage; its tameness in allowing me to ride within eight or ten yards was also good evidence of the fact.

1866.—On January 6th I shot a bird in that creamy-coloured plumage that I consider the second year's stage. This bird had been in one of my ploughed fields for several days past.

On February 19th I rode within ten yards of a bird, in its first year's plumage, as it was resting on the Enniscrone Sands.

1873.—On Sunday, January 26th, as I was walking with my friend, the late Captain Dover, near Dooneen House, a bird flew out from the fields and pitched on the road within twenty yards of where we were standing, then after some time searching for

food, flew low up along the road for about two hundred yards, and then disappeared over the fields. This was a very dark-coloured bird, evidently in its first year.

1877.—On Sunday, January 28th, as I was walking to church across one of my fields, I saw resting on the grass, among a number of small Gulls, a young Iclander, so very dark in colour that it must have been in its first year's plumage.

On December 26th, resting on the water with a young Herring Gull, near Killanly Marsh, I saw a young dark bird.

On December 29th, when walking on the shore below Enniscrone to Carrahubbock to obtain some Purple Sandpipers for a friend, I observed a young Iceland Gull among some small Gulls in a grass field, but as there was nothing to disturb them, I continued my way to the Sandpipers' haunt, when having obtained the required number of specimens I returned, and when passing the field where the Gulls were resting I saw the Iclander still among them. Intending, if possible, to secure the bird, I was just entering the field when it rose, flying to the shore, and passing close to me; so, taking my gun, I brought it down with a charge of No. 5 shot. It was a very fine specimen, apparently in its second year.

1887.—On October 9th I shot the young bird that had been haunting the shore field, following the ploughman for several days, feeding on the grubs and worms.

1892.—On January 9th I fired at a young Iceland Gull flying past my boat.

On January 10th I again saw the Gull near the point, but without obtaining a shot.

On February 3rd, below Enniscrone, on the Carrahubbock shore, I saw an immature bird standing on a flat rock along with several young Herring Gulls. Having no gun with me, I was obliged to content myself by using my glass, by which I easily identified it, by comparing its slight build with the other Gulls, and having a clear view of the ends of the closed wings extending beyond the ends of the tail feathers.

On February 15th either an Iceland or Glaucous Gull was seen near Rinroc, but too far off to be identified (doubtful).

1898.—On June 19th, as I was driving to Oghill, and when half-way between that place and Enniscrone, on passing a field

by the side of the road in which a man was ploughing, I was surprised at seeing an Iceland Gull along with some young Herring Gulls following the ploughman, feeding on the grubs and worms turned up. It was the first instance I have known of an Iceland Gull met in summer.

1902.—On January 29th either a young Iceland or Glaucous Gull, with a young Great Black-backed, was seen on the water near Killanly Marsh (not identified).

1905.—I omitted, by an oversight, to enter the exact date on which I walked to Enniscrone, after a heavy gale had been blowing, to see what birds had been driven into shelter. On reaching the sands I saw a large number of Herring Gulls, very noisy, hovering over a little sheltered bay near the Bath House. After watching them for some time, I recognised three Iceland Gulls in the crowd, so running down to the edge of the water I waited, closely watching the clamorous birds as they circled round, until one of the Iceland Gulls came within range, when I brought it down with an Eley's wire cartridge—a fine bird in the second year's plumage. I then reloaded, but having had only the one wire cartridge, I was obliged to use No. 5 shot; when a second bird came near I fired, but only slightly wounded it, and it flew away down the shore, the No. 5 shot being too light to act effectively on the thick coat of feathers on these Arctic Gulls. Although I waited for over an hour, the third bird gave me no chance of a shot.

On April 26th, I was walking along the Moy View shore with my dogs, and when I got to the point I saw at the other side of it, resting on the water, a young Herring Gull, and what I first thought was an Ivory Gull, on account of its white colour. I immediately returned, put up my dogs, got out my punt and paddling round the point, found that the Gulls had moved farther off. I moved on slowly and quietly, and getting within range, knocked over the White Gull, which, instead of being an Ivory, proved to be an Iceland Gull in the white stage, assumed both by Glaucous and Iceland Gulls the summer before the autumn moult, when they take on the adult plumage.

1906.—On December 10th as I was putting out my punt for a day's shooting, a fine Iceland Gull passed close by, flying round the point.

On December 14th I again observed the Gull. This was the last Iceland Gull I saw in the Co. Sligo, leaving Moy View in October, 1909, and coming to Ardnaree, Monkstown, Co. Cork.

GLAUCOUS GULLS (*Larus glaucus*) IN KILLALA BAY AND THE
MOY ESTUARY.

1859.—My first acquaintance with this fine Gull was at Moy View on December 14th. There had been a heavy fall of snow the previous night. When looking for cocks, and passing along the shore from one small wood to another, a fine Glaucous Gull was flying past. I fired at it, but failed in stopping it. Evidently an adult from its very white appearance.

1871.—Either a Glaucous or an Iceland Gull was seen on the sands near Rinroc on March 29th.

1873.—On January 13th a fine bird seen on the sands.

On January 23rd, when out in my shooting-punt, observing a fine adult bird with some Herring Gulls near Cardens Island, I paddled on to it, but my small gun missing fire, the noise of the cap disturbed them, and they all flew off a couple of hundred yards; giving them time to settle down, I again moved near, and firing my big shoulder-gun, obtained a fine specimen of an adult.

1875.—A young bird seen on the sands.

1877.—On February 24th, seeing a fine bird flying past when my punt was hauled up I fired, but failed in stopping it.

On March 16th, when out in my shooting-punt down the Moyne Channel after Wigeon, a fine bird flew past, and wheeling round to take a closer view of the punt, came within range. I fired, and had the pleasure of bringing down a splendid bird in adult plumage.

On December 21st I saw on the sands near Scurmore a bird very dark in colour, but I think it was in its first year's plumage.

1878.—On January 17th, when in my shooting-punt down channel near Scurmore, and while I was looking at a young Black-backed Gull feeding on some carrion cast up by the tide, it was joined by a young Glaucous Gull, which though as large and strong-looking as the Black-backed Gull, had not the courage to fight for its share of the feast when driven away by the other Gull; flying further down along the shore it came to a dead dog,

on which it began to feed so greedily that it let me bring up the punt within shot, when it paid the penalty of its greediness by the receipt of a charge of No. 5 shot from my cripple-stopper. It was a fine full-grown bird in its first year's plumage.

1880.—On February 27th I shot the Glaucous Gull that, for several days past, had been feeding on the carcase of the bullock lying on the shore. It was so excessively wary and watchful that, day after day, I failed in obtaining a shot at it. However, this day I changed my tactics, and creeping a long way behind a fence, I got within range, but the moment my head appeared above the fence it was off, but too late to escape the charge of No. 5 shot that brought it down dead. It was a remarkably fine specimen of the Glaucous Gull (adult), weighing $3\frac{1}{2}$ lb., carpus measuring 17 in., length $28\frac{3}{4}$ in. Some time before I shot an adult 29 in. in length, carpus 18 in., but it was not so heavy.

Early in December I met a fine bird on the Enniscrone Sands feeding on a dead bullock. It was so wary that I was unable to get within range and, firing a long shot, it got off, though hard hit.

1895.—On February 5th, when down channel near Bartragh, in my shooting-punt, I saw a fine bird among some Herring Gulls near Barrett's Island resting on the water. They all rose on the approach of the punt, but it fled round Barrett's Island. I followed, and coming within range, knocked over a fine adult.

1901.—On January 1st I saw an adult bird near Bartragh, its flight was just as slow and heavy as that of the Great Black-backed Gull. However, I failed in obtaining a shot.

1905.—On February 14th, when out in my punt passing the point, I saw a bird that I thought was an Iceland Gull from its size, but on shooting it, it proved to be a very small, immature Glaucous Gull.

This was the last either shot or observed by me, as I left the district shortly after.

It is strange that more Iceland Gulls have come under my notice than Glaucous Gulls, and also that I have seen only one Iceland Gull in adult plumage, while of the thirteen Glaucous Gulls observed, seven were birds in the adult plumage. Also, I may remark that severe winters did not increase the numbers of either species.

RELATIONSHIP OF SPECIES.

BY H. PANTON.

(Continued from vol. xvii., p. 455.)

ABOUT fifteen years ago I wrote a short paper as a kind of summary of hybridisation, in which the results seemed to me, as far as I could then gather, to tend to confirm the views I put forward, and I cannot perceive that they do not apply equally to the present time. I was then unaware that these different degrees of hybridisation had been worked out and named by Broca as long ago as 1864.* I will quote a good deal from my old article on the subject.

“ Presumably, in the course of evolution, animals, when only slightly changing from each other, produce fertile young or mongrels; but when in the course of time their differences become intensified, they produce infertile young or hybrids; and finally, when still more changed from each other, they will be unable to produce young at all. And again, presumably, as these differences must grow gradually, there must be intermediate states between these three stages, *i. e.*, between the first and second, when the produce will be occasionally fertile (more or less); and between the second and third, when the contracting animals will only occasionally produce young.”

Adding to the examples I then recorded, the table now gives:—

A. Animals producing fertile young (mongrels).

Examples: Bison and Cow, Yak and Cow, Zebu and Cow, Gayal and Cow, Jaguar and Leopard, Dog and Wolf, Dog and Jackal, Brown and White Bears, Zebra (true) and Ass. Golden and Amhurst Pheasant, Hooded and Common Crow, Pintail and Mallard, Tufted Duck and Pochard, and various other birds. (These correspond to Broca's Eugenetic hybrids, “being fertile

* ‘On the Phenomena of Hybridity in the Genus *Homo*.’

inter se, and breeding easily and indiscriminately with the parent species.")

B. Animals producing young more or less fertile.

Examples: I was at that time only able to presume perhaps *Chrysomitris* and *Serinus*, but suggested that reports one heard of Mules breeding might serve as examples; since then I have seen that Broca had described several graduations from "Paragenesic" (with a "partial fecundity") to "Dysgenesic," "nearly altogether sterile" (i. e., infertile with each other, but sometimes rarely breeding with one of the parent species, these three-quarters young being infertile): Broca's examples were chiefly drawn, and perhaps not very correctly, from various human hybrids. Another example, however, is Pigeon and Collared Dove (Suchetet).

C. Animals producing sterile young.

Examples: Lion and Tiger, Horse and Burchell's Quagga (which I only then included as "probable"), Duck and Muscovy, Blackcock and Pheasant, *Serinus* and *Carduelis*, *Serinus* and *Ligurinus*, *Serinus* and *Alario*, &c. This degree, "entirely infertile," Broca termed "Aganesic."

D. Animals mating, but not always producing young.

Examples: Horse and Ass (nearly always), *Carduelis* and *Pyrrhula*, *Ligurinus* and *Carduelis* (frequently), *Serinus* and *Pyrrhula* (very rarely).

Broca does not specify this stage. Lest it should cause surprise, I may state that I have included Horse and Ass here on the authority of Tegetmeier and Sutherland,* who state some mares quite capable of producing young to a Horse do not do so to an Ass. (I have heard, however, of *vice versâ* results being obtained.)

E. Animals mating, but not producing young at all.

Examples: Sheep and Goat, Eland and Cow (?), Buffalo and Cow (?), *Fringilla* and *Serinus*, Seed-eater (*Crithagra*?) and *Serinus*.

These results, meagre though they be (I could name several more, however), seem to my mind to apply very correctly to the degree of relationship of the contracting parties.

In stage A. all these contracting parties seem to have very many if not entirely corresponding congeneric actions, or "in-

* 'Horses, Asses, Zebras, Mules, and Mule Breeding' (1895).

dividualism," and to be so nearly akin that they seek these mates with mutual satisfaction and as much or nearly as much avidity as they do their natural consorts.

In the middle division C. the animals have so far receded that hybrids of this class are harder to get. There seems to be less attraction between the combining animals, and they have often to be kept together, and away from their proper mates, before they will copulate.

In D. anyone with experience of Mule breeding will note the general want of affection between the ass and the mare, or the stallion and she ass.

And in E, this mutual intolerance is perhaps somewhat more apparent still.

All this looks so remarkably gradual, so evident and simple, that there appears no anomaly of any kind, except those which the arbitrary (and changing) barriers of our classification schemes erect. There are, however, a number of curious and contradictory results obtained by plant hybridisations that are difficult to understand; they occur also, as Mr. Finn has pointed out, in birds,* *viz.*, that a hybrid that is hard to get, Wood-Pigeon and Common Pigeon (and which we might expect to class in group D. or E.), proves fertile, and, therefore, apparently has to be included in group A. (I should like to see this experiment repeated.) I do not think these aberrant results (or as we think them aberrant) destroy the results which we get in the above table, or the evidence which this brings forward of a certain gradual tendency and law in hybridisation. These graduating results, however, perhaps do not seem altogether so amicable to the fascinating theory of evolution of species by spontaneous variation or mutation, as they do to "indefinite" variation. Darwin held it probable that species arise but rarely violently in this way (which is suggestive of the theory of Cuvier and others of the separate creation of species), but generally by the slowest and most gradual changes, as we will notice later on. Still this debatable point has never been settled. One must bear in mind, however, before definitely stating, as some may do, that these anomalies destroy our more general results, that in breeding with wild forms, environment or change of food

* 'The Feathered World.'

affects fertility in so much that many species, the Fox notably, fail, as a rule, to reproduce in captivity. Curious phenomena such as this emphasise the great power environment has on the reproductory organs, as Darwin long ago pointed out, and this impresses one to take the view that environment is one of the great causes of evolution. Therefore, we must bear in mind that this may be the cause acting on the anomalies mentioned above, and which therefore may by no means be anomalies, although, to be fair, one is bound to admit that this cuts both ways, and may invalidate or put out of court some of the seemingly correctly graduated examples I have given in my table. At the same time, one might mention that Darwin hardly makes out any case for his supposition that domestication affects fertility to such an extent as to cause species unfertile while wild to become fertile together in their domesticated forms.

At the time I first wrote out the above table I felt quite confident that it was the proper thesis; since then, however, I hope I have learnt to put no very definite trust in anything.

When we dabble in relationship between animals whose common progenitor we know not, the length of whose separation we know not, and whose blood affinities we know little of, we cannot expect our results to be always as we should expect. It might be permissible to speculate whether environment and other effects, which are said to produce the separation of species and cause their physical attributes to become different, can cause them to come together again, so that animals once sterile can once again converge and become so alike as to again breed. It might be possible for the germ plasm to be so affected, however unlikely; this would result in anomalies, and such phenomena as species becoming fertile together in confinement, while sterile in nature, as Darwin considered probable, but which might equally well be held to be improbable.

All the animals in Class A., term them different species, or genera, or what you will, one can only, independent of structure, hold to be, through blood affinity, nothing more than Nature's evolving varieties, in the same way that the Cochin Fowl and the Minorca Fowl are varieties, or Newfoundland and Pug Dogs, and there is not much doubt that if these latter (having gone through exactly the same conditions of evolution

as they now have) were discovered wild, they would immediately be put down as different species, and held to be far more distinct than they now are.

Returning again to birds and taking, for instance, a favourite example of those who are fond of quoting the "extraordinary results of hybridisation," what can appear more unlikely (when we become familiar with their congeneric actions) than to expect the young of Chinese and common Geese to be sterile, although a classification (apparently faulty) formerly separated them? Again, how does an Amhurst Pheasant differ from a Gold more than an Azeel Fowl from a Hamburg? Why are the two former different "species," and the two latter different "varieties"?

These barriers would seem to be somewhat pedantic.

Turning to the *Anatidæ*, let us take some six species and note their grouping:—

1. *Plectropterus* . P. D. S. Subfamily *Plectropterinae*.
2. { *Anser* . . . R. — — } Subfamily *Anserinae* (Geese).
 { *Chlæphaga* . R. D. S. }
 { *Chenalopex* . R. D. S. }
3. { *Tadorna* . . P. D. — } Subfamily *Anatinae* (Ducks).
 { *Anas* . . . P. D. — }

Note.—P. = front of metatarsus covered with large plates. R. = metatarsus covered with reticulated scales. D. = windpipe dilated at lower end. S. = spur on wing.

We thus see that *Plectropterus* (Spur-wing Geese) is placed in one subfamily; *Anser* (true Geese) with the Upland Geese and Egyptian Geese (*Chlæphaga* and *Chenalopex*) in a second, *Anserinae* (Geese); and the Shelduck (*Tadorna*) and true Duck (*Anas*) in a third, *Anatinae* (Ducks).

From what I have been able to see of the natural habits, actions, dispositions, cross-breeding, and calls, I should consider them allied as follows (call it blood relationship, essence, germ plasm, physiological unity, or what you will):—

<i>Anser</i> (with <i>Bernicla</i> , &c.).	.	.	.	.	Geese.
<i>Plectropterus</i> (?)	.	.	.	.	} Sheldrakes.
<i>Chlæphaga</i>	.	.	.	.
<i>Chenalopex</i>	.	.	.	.
<i>Tadorna</i>	.	.	.	.
<i>Anas</i> (with <i>Dafila</i> , <i>Aix</i> , &c.)	.	.	.	.	Ducks.

It would appear that they are so classed in the first list chiefly on account of the reticulations or plates on the metatarsus, general size, and length of leg. This grouping appears far from their true natures. All the birds that I have classed in my list as Sheldrakes are spiteful birds, with great similarity in habits and calls, and are all, I believe, infamous eating, while the peculiarities on which they are generally classed are perhaps parallelisms or independent mutations.

All these birds hybridise together more readily as I have grouped them than with members of the other groups. *Plectropterus* may be only a possible inclusion. It has interbred with *Chenalopex*, however, but I am not altogether familiar with it. *Chlæphaga* and *Chenalopex* have an individuality quite typical of Sheldrakes, that is, in the points I have named, and they no more look and act like Geese or Ducks than a black Donkey looks or acts like a black Horse.

Mr. Finn, whom I quoted just now, and who has written an interesting account of the different waterfowl,* is, I believe, struck with this resemblance himself, and styles the larger of these birds, or some of them, "overgrown Sheldrakes." *Chlæphaga* (the most Goose-like), which as a group is often referred to as "the Southern Brents," may resemble to some extent *Bernicla* (which is apparently a true Goose), but it has none of a Goose's ways or characteristics, neither has it any love for Geese, judging from how they hunt these birds about, when breeding, in a somewhat un-Goose-like manner.

Chenalopex resembles *Anser* in no respect whatsoever, except in the reticulated metatarsus, and *Tadorna*, which, being the smallest, most resembles the Duck tribe, seems in every way dissimilar to these latter birds.

I have had a good deal to do with *Tadorna* in confinement, and having been born where these birds breed in large quantities I have taken much notice of them and their natural habits. I have, for instance, when engaged in punt-gunning during very bitter weather (and when for several days and nights on end I would take up my quarters in a sailing boat), been particularly struck with the fact that I have never on any one single instance noticed Shelduck in company with any of the *Anatinæ*, even

* 'Fancy Waterfowl' (1900).

when the weather has been so severe that these others have been driven up into more or less mixed bands. I have read that *Tadorna* has interbred with *Anas*; this is, of course, quite possible, but although I have seen many Sheldrake hybrids *inter se*, or rather between birds which I have classed as "Sheldrakes" above, I have never seen this one, and therefore imagine it to be rare at any rate, and as, where a large variety of Ducks are kept, it is not always possible to be sure of the parentage, it would be well to be certain as to this before accepting these crosses.

The last uncongenial grouping, and one which seems by some naturalists so to be held, is in the *Viverridæ*, where we see the inodorous Genets classed with the strong-smelling Ichneumons.

Ought not the *Viverrinæ* to come with the *Felinæ* under *Felidæ*, and the *Herpestinæ* to join *Protelinæ* and *Hyæninæ* under a family heading *Herpestidæ*?

While the Genets appear to be long-faced primitive Cats, the Ichneumons, in their genital parts, much resemble the Hyænas, and the two groups appear dissimilar. Ichneumons, when attacked by an opponent of superior mettle, have a curious method of defence: they turn upon their backs and seem to fold their hind quarters back over their bellies, protecting themselves with their powerful jaws. (An Ichneumon easily kills a Ferret, which kills a Cat.) It is interesting to note that a Hyæna, when overmatched, has somewhat the same method of defence when tackled, for instance, by the Lion, except that it is apt to wave its legs about in the air rather more. Perchance, if related, as it may be, to the Ichneumon, it has more difficulty in arranging a safe position for its long evolute (?) legs. Far be it from me to give advice to any Hyæna as to what it should do in such embarrassing circumstances, but, judging from what I have seen of the beast when so set upon, and from the fact that Hyænas have been found on the veldt with their legs bitten off but otherwise uninjured, it is possible it might come off better if it kept these tucked away after the fashion of its smaller relative; for it appears likely that the Lion has considerable respect for its powerful jaws.

To show how contradictory our classification is in indicating

kinship concerning such an important matter as the production of young (and incidentally the continuation of the race, even if only a mongrel one), one has only to summarise the instances given above, such as:—

The non-production of any young between members of the same species (*Oryctolagus* * *cuniculus* and *O. huxleyi*).

Between members of the same genus (*Bos taurus* and *B. bubalus*).

The production of sterile hybrids between those of another genus, *Equus* (*E. caballus* and *E. asinus*).

And the opposite results, such as the production of hybrids between members of even different families (*Ligurinus* and *Acanthis*).

And the production of possibly fertile hybrids between different genera, as *Cercopithecus* and *Cercocebus*, *Macacus* and *Cynopithecus*, and *Macacus* and *Papio*.

With a possible exception of *Cercopithecus*, I should imagine all the hybrids of the *Cercopithecinae* would be fertile; a supposition hardly likely to be proved either way, unless, indeed, the subject receives as much attention in the future as it has neglect in the past.

(To be continued.)

* More generally known as *Lepus*.

NOTES AND QUERIES.

MAMMALIA.

An Albino Water-Shrew.—It may be of interest to note that the Natural History Museum has just received a nearly perfect albino of the British Water-Shrew (*Neomys fodiens bicolor*). The upper surface is completely white except just across the shoulders, but the under surface shows a certain suffusion of brownish. The specimen was sent from "South Hampshire" by someone who did not enclose his name. Should he see this notice, I should be obliged if he would send me his name and address for entry in our Registers.—**OLDFIELD THOMAS** (Natural History Museum, S.W., Dec. 20th, 1913).

AVES.

Status of Blackcap and Garden-Warbler.—Mr. Butterfield asks for the experiences of other ornithologists in regard to the relative abundance of the Blackcap and Garden-Warbler.* The difficulty in forming a judgment, as he probably recognizes, is that of distinguishing the two birds' songs; for it is hardly once in twenty times that you get a satisfactory view of the singer. When the Blackcap sings its *whole* song there should be no doubt as to its identity; the song ends with a brilliant passage such as never occurs in the Garden-Warbler's. The Blackcap, however, often stops short of this final passage, and then there is less to distinguish it by. But though it is undeniably one of the nicer distinctions among birds' notes, it is still usually not impossible. The Garden-Warbler's song is quieter in manner and more level in tone; the Blackcap's has more of the effect of sparkle and "cross-hatching" among the notes. If my ear is to be trusted, it leaves me in no doubt about the correctness of Mr. Butterfield's opinion. Wherever I go in early summer I hear more Garden-Warblers than Blackcaps. The fact struck me last May in two such widely separated counties as Northumberland and Sussex.

The Lesser Whitethroat, curiously enough, is another bird which seems to retain an undeserved reputation for scarcity; curiously, because its song is so unmistakable that there should be no difficulty in estimating its relative numbers anywhere. There are parts of the

* 'The Zoologist,' 1913, p. 431.

country, no doubt, where it is scarce—Northumberland is one of them—but in ordinary country in most parts of England it seems to be common enough. It certainly is so, for example, in the plain of York and in Cheshire. In Sussex (last summer, at any rate) it was one of the commonest of the Warblers, and the "common" White-throat was singularly scarce. I do not think I should be wrong in stating that I heard twenty Lesser Whitethroats in Sussex for one common Whitethroat.—E. LEONARD GILL (Newcastle-on-Tyne).

Glossy Ibis in Norfolk.—The Glossy Ibis (*Plegadis falcinellus*) has again been found in Norfolk, one having been shot on Oct. 28th, 1913, at Acle, nine miles west of Yarmouth. Mr. Lowne, our local taxidermist, on dissecting this bird, found it to be a male. The visits of this species to Norfolk generally occur during the autumn months. The following notes relating to the past eleven years may be of interest:—Nov. 28th, 1902, one shot on the river Bure. August 22nd, 1903, one shot at Halvergate, Sept. 3rd, 1906, four seen flying over Breydon; these escaped. Dec. 2nd, 1909, one shot on the marshes between the river Bure and Breydon. Nov. 2nd, 1912, one shot at Fleggburgh, and another shot on the Burgh Marshes on Dec. 2nd in the same year. All these localities are within about ten miles of Yarmouth.—B. DYE (Great Yarmouth).

Ornithological Notes from Yorkshire.—*Red-backed Shrike as a Breeding Species.*—In the sixties a friend of mine showed me a pair of the above species which had nested, so he alleged, on Silsden Moor—which, however, is not a moor in the ordinary acceptation of the term, but embraced some rough ground in an elevated part two or three miles north of Keighley—the authenticity of which I never doubted. I communicated the facts to Mr. Nelson, who considered the evidence not satisfactory, but on what ground it is not stated (see 'Birds of Yorkshire,' vol. i. p. 142). We have it, however, on the authority of S. L. Mosley that the Red-backed Shrike has nested near Keighley, and Mr. Walter Greaves, in his 'List of the Vertebrate Fauna of the Hebden Bridge District,' reports the nesting of this species, on the authority of J. Cunningham, at Dudwells in 1885 ('Birds of Norland Clough'). The Red-backed Shrike is a rare nesting species in Yorkshire. One (in addition to the above case) of the most recent cases is reported by W. Guygell in 1889 on Oliver's Mount, Scarborough.

On Nov. 29th, 1913, a Swallow was seen flying over the river Calder between Hebden Bridge and Mytholmroyd, near Halifax. In the seventies I saw one flying about near Bingley for a few days, but

each day it seemed to be getting weaker, and I have little doubt it ultimately died of starvation. This is the only one I ever saw in this district in November. Recently I spent about a fortnight in Belgium, and what struck me most in bird life was the comparative scarcity of the House-Martin about the towns and villages I visited. I was pleased, however, at seeing a fair number breeding in Dinant. The Swallow was by far the commoner species, and in one of the busiest towns I visited, it could be seen darting about in the principal streets after insects, much after the manner with us of the House-Martin. November, 1913, had been a most remarkable month for a high average temperature. Various species of birds on December 3rd were feeding in the wood on elderberries and blackberries of good quality. The Blue Tit is very fond of elderberries; indeed, the Tit family are very omnivorous in their feeding habits. I see the Marsh-Tit occasionally feeding upon the seeds of thistle, and H. B. Booth writes me that this species will feed sometimes upon the softer portion of maize. On Nov. 3rd I heard the Song-Thrush singing almost as if it were May, at Bingley, I believe the only instance so late in the season.—E. P. BUTTERFIELD (Wilsden, Yorkshire).

NOTICES OF NEW BOOKS.

The Gannet, a Bird with a History. By J. H. GURNEY, F.Z.S.
Witherby & Co.

THIS is probably one of the largest books devoted to the history of a single bird. Mr. Gurney writes: "My conscience pricks me with having occupied five hundred and sixty pages with the history of one bird, but I console myself with the reflection that, had the bird been the Cuckoo or the Raven, the book would have been much longer." Even now, if the Gannet's behaviour had been recorded by some of our patient and qualified bird-watchers, this publication could have been increased in size, and then it would have been none too big, for Mr. Gurney has inaugurated a new departure in the literature of natural history which may well, and will doubtless, be followed by other naturalists, though not, it is to be hoped, by the ordinary compiler. These pages are rich in topographical details and biographical reminiscences, and their author seems to have consulted most of the literature that it is possible to trace on the subject, some

of the translations contributed by the late Prof. Newton being particularly valuable.

Stress is laid upon the probable great longevity of this bird, based on its habits and limited nidification, and referring to the visit made by Ray and Willughby to the Bass Rock in 1661, Mr. Gurney makes the interesting remark that "there is nothing preposterous in the supposition that there may be Gannets living on the Bass Rock now which were there in Ray's time, for we know nothing of the ages which birds attain to."

An interesting chapter on "Mortality among Gannets and Liability to Accidents" promotes views on avian life outside the Gannet limitation. Mr. Gurney is of opinion that, "so far as we can judge, death from old age is by no means the usual termination of a wild bird's life. Reflection leads us to the rather startling conclusion that nine birds out of ten meet their deaths by accidents or by starvation." Good argument can also be found against the uninformed agitation sometimes prevalent that a destruction of sea-birds (including Gannets) is necessary for the purposes of human fish supply; Nature can be better left to manage her own supply and demand.

The Gannet has now found a biographer, and ornithology is enriched by a really good book, which will be authoritative and long-lived like its subject.

Bird Life throughout the Year. By JOHN H. SALTER, D.Sc.
Headley Brothers.

THIS is a pleasantly written book detailing the avian events, arrivals and economy which, under normal circumstances, may be looked for and observed during the different months of the year in this country. It is well illustrated, many of the coloured plates, however, being taken "from cases in British Museum, South Kensington." Dr. Salter, on the whole, believes in the efficacy of game-preserving as a protection to many of our smaller birds. "It may be likened to the arm of the law which descends with crushing force on the evil-doer, while promoting the happiness and security of the general public"; and further on we read: "Comparison with the state of things which prevails upon the Continent brings the conclusion that England is pre-eminently the country of small birds, because nowhere else is

game-preserving so general. Only let the matter be carried on with rather more discrimination and humanity, and every naturalist will express his indebtedness to the system." The system doubtless, on the whole, works for good, but the danger is in the amount of ornithological intelligence of the "keeper," and the restraining influence of his employer. The operations of an ignorant and unchecked keeper, from the zoological point of view, are often deplorable.

In this book the general lover of birds will find much interesting information.

EDITORIAL GLEANINGS.

FLAMINGO IN LANGSTONE HARBOUR.—Mr. W. Kingdom-Murrill, writing in the 'Shooting Times' of December 20th, 1913, reports that an adult Flamingo was shot in Langstone Harbour, near Portsmouth, on Wednesday, December 10th. Although the bird showed no signs of captivity, naturally there is a doubt as to whether it may have been an escape, though there is nothing against the supposition that the successive south-westerly gales may account for the appearance of this southern species on our coast. It is, at any rate, the first known example that has been recorded from Langstone Harbour; but in November, 1883, a similar adult specimen was obtained near the Beaulieu River, nor far distant.

At the Quarterly Meeting of the Kent and Essex Sea Fisheries Committee, held recently (1913) at the Fishmongers' Hall, London, Dr. Murie reported that this season there had been very large quantities of fish, called "Fenians," caught off Leigh and Southend. These fish were like a small whitebait, and it appeared that they came periodically when the wind and tide were under certain special conditions. Mr. Hussey said that more Conger Eels had been caught this season than he had ever known. Off Deal, a Mr. Olbey had a large catch of Congers, nineteen of them weighing 316 lb. The largest weighed 40 lb., others 37 lb., 36 lb., and down to 10 lb. Off Dungeness, also, large quantities of Pilchards had been taken, and this was exceptional. At Deal it appeared that the temperature of the water was 3.1 higher than the average temperature in November for the last ten years. Several members also spoke of the fish mentioned by Dr. Murie, and said there were millions of them off the Kent coast. They were called "whiting pout" there.



